AGRICULTURAL NEWS LETTER

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This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the Du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.

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The AGRICULTURAL NEWS LETTER serves as a medium of reporting new developments and new ideas in the field of agriculture, particularly as they are related to advancements through research. Material appearing herein may be reprinted in whole or in part, in the interest of advancing the general knowledge of new agricultural practices.

This publication is available on microfilm. Beginning with Volume 17 (1949), it may be obtained in this form from University Microfilms, 313 North First Street, Ann Arbor, Michigan. The cost is $1.50 per volume, plus 10 cents for packing and mailing. All orders should be sent to Ann Arbor.

WHAT FARM EDITORS ARE SAYING --

"This enterprising county agent took all of the barbers in the county on a tour of farms where he had some interesting ideas developing. Barber shops being the debate and information centers which they are, he knew he would get his programs talked about." -- Fred I. Jones in THE INDIANA FARMERS GUIDE.

"Progress of the past 50 years is proof that years ahead will be equally significant with new developments in agriculture... Insect and weed control, antibiotics, artificial crop drying and many other present-day developments are new within the last 10 years. Research is the agency that will bring about these changes if we give it a chance to function fully." -- Tom Leadley in COLORADO RANCHER & FARMER

"Two pounds of peas in the pod will shell out about the same weight as contained in a frozen package. Today's homemaker, due to the rapid tempo of modern living, doesn't feel she has the time that grandmother had to sit and give her feet a rest while shelling peas and indulging in some reflective thinking." -- Dick Meister in AMERICAN VEGETABLE GROWER

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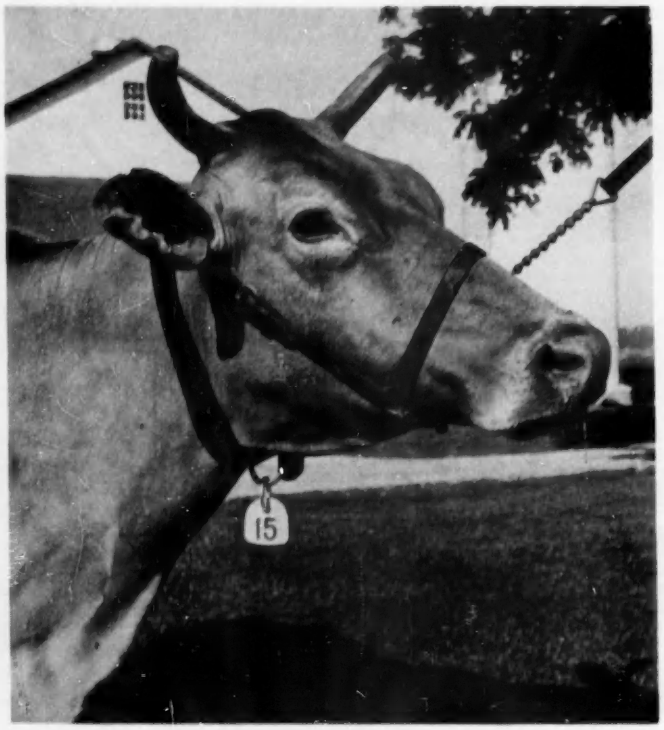
HAPPY FARMING, LARRY!

Larry Livingston has retired at the age of 65 as manager of the Extension Division of the Du Pont Company. He's gone back to his first love -- farming -- on a beautiful place along the banks of the Sassafras River, just before it flows into the eastern part of Chesapeake Bay. Larry came to Du Pont from his post as director of agricultural engineering extension work at Michigan State College. He started with the company as an explosives engineer, but widened his activities to include an intimate knowledge of the whole broad field of chemical developments. It was at his suggestion that the "Agricultural News Letter" was started and through his 26-year career at Du Pont he has kept abreast of every agricultural development. He has brought the story of Du Pont progress to people in many parts of the world, who have heard him speak and seen him demonstrate the latest marvels of chemical research. Many of the readers of this news letter know Larry as a personal friend and adviser and will join us in wishing him every happiness in his retirement.



Bossie's wearing nylon -- but it's molded. Her identification tag is molded of tough "Zytel" nylon resin. The identification number, filled with black neoprene synthetic rubber, remains easy to read indefinitely.

NEW NYLON ACCESSORY

BOVINE FASHION NOTE

Whether they be pure-breds with polished horns or hard working grade Bossies in a commercial herd, your cows can now wear nylon.

A far cry from the hosiery by the same name which the Missuz prizes, these bovine nylons are new identification tags designed to be worn on collar strap or neck chain. They are made by an Illinois manufacturer who molds them of white "Zytel" nylon resin. The resulting plastic tag is guaranteed unbreakable under normal conditions of use.

Another advantage of the nylon tags is the manner in which identification numbers are affixed -- engraved deeply into the nylon, then filled in with black neoprene synthetic rubber. This results in a number which stands out so prominently it can be read as far as you can see the tag across a corral or down a line of stanchions in the barn. Also, these numbers don't rub off and get dim with wear, as is the case with some engraved or stamped metal tags. Indeed, tests which left other cow tags bent, completely illegible, and worn through at the grommet, had almost no effect on the new nylon tags, the manufacturer says.

BIGGER PRUNES

Prune trees sprayed with 2,4,5-T at the beginning of pit hardening, early in May, produced fruit that averaged about a fifth larger than from unsprayed trees, in experimental work at the University of California. French prunes from sprayed trees ran from five to 18 fewer fruit per pound, and brought a higher price per ton as well as a larger total tonnage. More experience is needed to determine proper timing and concentration of the chemical to give best increase in size with minimum initial damage to fruit and shoots.

EFFECTS OF FREE-CHOICE INGESTION OF PHENOTHIAZINE ON THE INCIDENCE OF CATTLE GRUB

By Benjamin Schwartz, Ph.D., Animal Disease and Parasite Research, USDA, Beltsville, Md.; Dale A. Porter, Sc.D., and Harry Herlich, M.S., Regional Animal Disease Research Laboratory, Auburn, Ala.

The currently recommended methods for controlling cattle grubs, involving the application of rotenone in sprays, washes, or dusts, have two major weaknesses, as follows: (1) To obtain effective results from treatment requires the cooperation of every cattle owner in the area in which the control measures are being applied, and (2) their application does not preclude damage to the hides of the animals involved in the control program. As a matter of fact, treatment is begun after the grubs have reached the backs of the cattle and punctured holes in the skin. It certainly would be more desirable to attack this pest from an entirely new angle, if possible, and in a manner which would be effective in preventing the parasites from reaching the back. If this could be done safely, and on a practical basis, it would eliminate the loss due to damaged hides and the devaluation of meat cuts as a result of trimming the loins to remove the parasites and associated lesions.

In view of the fact that phenothiazine has been tested and used as a larvicide, and that the drug is known to be absorbed into the blood stream of treated animals, it was suggested that perhaps phenothiazine or one of its metabolic products might be detrimental to, or even kill, cattle grubs during their long larval life. At the time this suggestion was made in December 1952, investigations were in progress at the U. S. Regional Animal Disease Laboratory on the control of internal parasites of cattle by free-choice ingestion of phenothiazine in a mineral mixture. Accordingly, an examination was made of the grub population in six steers used in that work. The results of these observations were sufficiently encouraging to warrant further determinations on the effects of free-choice ingestion of phenothiazine for the control of internal parasites, including also cattle grubs. The data so collected, together with an interpretation of the facts, are herein reported.

Procedure

The first observations were made in the winter of 1952-1953 on six grade Jersey steers which had been used in studies on the effect of free-choice administration of phenothiazine on nematode parasites of cattle. Three of the steers had access to a medicated mineral mixture consisting of three parts each of bonemeal, limestone, and salt, and one part phenothiazine, whereas the three controls had access only to the unmedicated mixture. Subsequent to these studies, after the grub season, the steers continued on the same regimen on other pastures.

In the experiment conducted during 1953-1954, five of the cattle used the previous year -- one of the three controls having been

killed December 22, 1952 -- as well as a replacement animal, were involved in one group, and six in another, making a total of 12, of which six were principals and six controls. One group was on a pasture which was separated by a fence into two equal parts. The three steers which previously had been the test animals continued as such and had access to the phenothiazine-containing mixture on one-half of the pasture, and the remaining three served as nonmedicated controls on the other half. In addition, observations were made on six other calves grazing two pastures designated here as A and B. These calves had been used previously in the free-choice experiments aforementioned. Three calves on pasture A had access to the phenothiazine-containing mixture, whereas the three on pasture B served as controls and had access to the nonmedicated mixture. On October 26, 1953, it became necessary to feed grain, and phenothiazine was mixed, therefore, with the grain in sufficient quantity to insure an average daily intake of 2 grams of the drug per head.

All animals were examined by palpation weekly, and records kept of the numbers of grubs so detected. Examinations were continued until no more parasites were found.

Results

Table 1 gives the data pertinent to the trials made in two years, and shows the period during which phenothiazine was available, as well as the number of grubs that were detected in the backs of the principals and controls.

In 1952-1953 tests, animals consumed an average of 0 to 3 grams of phenothiazine per head daily, as previously recorded. No grubs were detected in steer 1242 or in its control, 1248. This may be explained by the fact that these two animals were in portable pens first and in a barn later, until May 5, 1952 and were not accessible to the heel flies. Observations made at Auburn, Alabama, indicated that maximum fly activity occurred during the months of February, March, and early April. Of the four steers which were exposed to strike, the two treated ones had an average of only 5.5 grubs, whereas the controls averaged 41 grubs, the ratio being approximately 1:8. It should be noted that treatment was discontinued on animal 1231 on June 30, 1952, six months before appearance of 11 grubs in its back. By way of comparison, 62 grubs were found in one of the untreated control animals, 1226. The number of animals involved in these observations was obviously too small for valid statistical analysis.

1953-1954 trials

The cattle that had access to phenothiazine consumed an average of 0.1 to 2.7 grams per head daily. Grubs began to appear in the backs of these animals in November, and all had dropped out by the end of February. The greatest number reached the back during December. Treatment was discontinued during the period December 16, 1953, to February 18, 1954, (Table 1). The number of grubs detected in the six treated steers ranged from zero to 16 per head, whereas the six controls had from 24 to 57 each. The treated group averaged eight grubs per head whereas the controls averaged 36, the ratio being

TABLE 1, Number of Grubs, Observed in Cattle Ingesting Phenothiazine and in Comparable Controls

Animal no.	Birth date	On pasture	Dates drug was available	No. of grubs found 1952-1953	1953-1954
1217	10-11-50	7-30-51	7-30-51 to 1-11-54	0	8
(1218)[1]	11-23-50	"		20	28
1231	5-31-51	10-11-51	10-11-51 to 6-30-52 12-22-52 to 1-4-54	11	14
(1226)[2]	4-13-51	10-11-51		62	—
(1238)[3]	8-23-51	12-22-52		—	35
1242	10- 1-51	5-5-52	5-5-52 to 1-11-54	0	11
(1248)	10-17-51	"		0	57
1270	7-31-52	12- 1-52	12-1-52 to 12-16-53[4]	—	16
(1268)	7-31-52	"		—	44
1286	9-29-52	3-9-53	3-9-53 to 2-18-54[4]	—	0
(1285)	9-22-52	"		—	24
1281	9- 1-52	1-19-53	1-19-53 to 12-16-53[4]	—	0
(1282)	9-12-52	"		—	28
			Treated Total	11	49
			Control Total	82	216

[1]Unmedicated controls in parenthesis.
[2]Killed 12-22-52.
[3]Replacement for 1226.
[4]Phenothiazine mixed with grain from 10-26-53 to 12-16-53.

1:4.5. Of special interest is the fact that all controls were infested, whereas two of those medicated (1281, 1286) were entirely free.

In view of the report that a few grubs survived injections of aldrin, dieldrin, and lindane, and that these larvae failed to produce flies, we attempted to determine whether phenothiazine might have exerted an injurious effect on the grubs. Treated steer 1242 and control 1248 were moved to stanchions in a concrete-floored barn on January 25, 1954, after being off the mineral mixture since January 11, a period of two weeks. Of the 17 grubs that remained in the back of untreated steer 1248, after it had been placed in a stanchion, six were subsequently picked up from the floor for further study. All pupated, with flies emerging from two pupae. Of 11 grubs in the back of treated steer 1242, ten were picked up, and all pupated, with flies emerging from five. All grubs had dropped out by February 11, those not picked up having been stepped on by the animals. There was no difference in the rate of emergence of flies from the two steers under observation. These results suggest that phenothiazine had no deleterious effect on the larvae which survived the medication.

Summary

Observations are reported in which the free-choice administration of phenothiazine appeared to effect a reduction in the number of grubs reaching the backs of cattle medicated free-choice with phenothiazine, as compared to comparable nonmedicated controls. In the first trial, three controls had a total of 82 grubs, and three medicated ones had a total of only 11. In the second trial six controls averaged 36 grubs per head, and six medicated animals averaged only eight per head. The difference of 28 grubs per head is statistically significant.

The results point to the probability that phenothiazine made available for prophylactic free-choice ingestion to control nematode parasites might prove of value also in controlling cattle grubs. The data here presented are only indicative and not conclusive. Many additional observations in different parts of the country will have to be made before the regimen of free-choice ingestion of phenothiazine can be evaluated as a grub control measure.

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Editor's Note: The above article is condensed from a report in a recent issue of "Veterinary Medicine."

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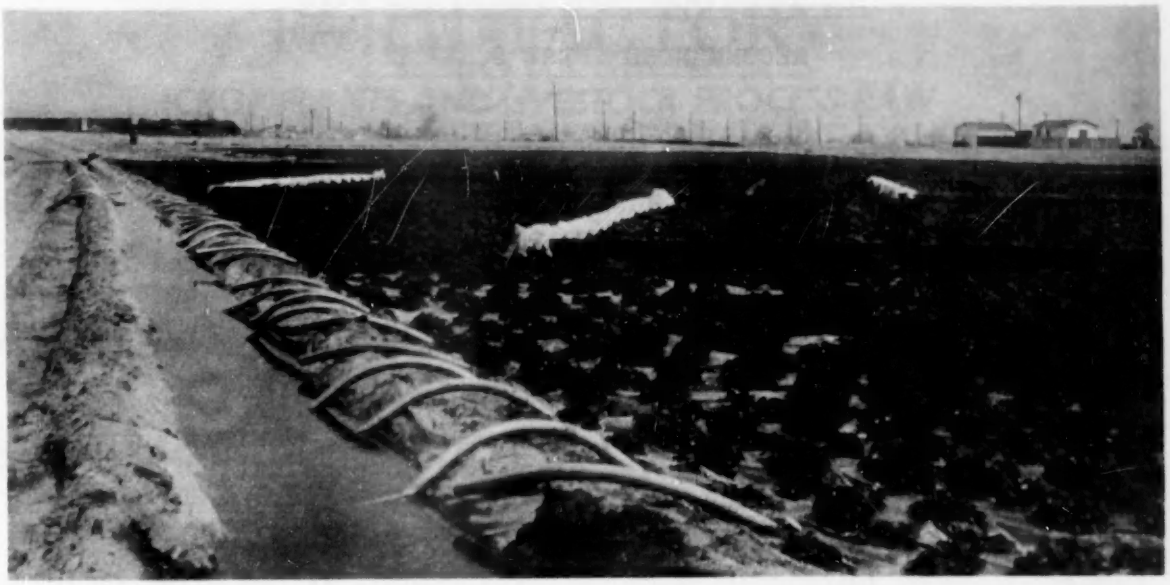


Water is a valuable commodity in Southern California farming operations. Polyethylene sheets, previously used for fumigating strawberry beds, are being used to line this ditch on a berry farm near Lomita. The plastic lining stops water losses through seepage into ditch banks and bottom. (Photo courtesy THE CALIFORNIA FARMER)

POLYETHYLENE DITCH LINING SAVES WATER

In Southern California's sprawling Los Angeles County, strawberry growers are making polyethylene film do double duty in their operations.

The photo shows an irrigation ditch on the Ishibashi strawberry farm near Lomita. This ditch is lined with a sheet of polyethylene, which had previously been used as a tarp over the berry plants during fumigation to kill cyclamen mites.

As a ditch lining material, the polyethylene serves to stop water losses in the main canal and assure that the water is used to promote berry production, rather than a growth of weeds on the ditch bank. Aluminum siphon tubes are also used to direct the flow between the rows of plants.

The polyethylene used in this application is four mils (.004 inch) in thickness. At current prices, it would cost $1.17 per 100 square feet and can be obtained in widths up to 56 inches.

RUTGERS FINDS UREA COMPATIBLE WITH RECOMMENDED SPRAY SCHEDULES

The compatibility of urea in combination with pesticide sprays for apple trees has been tested by the Agricultural Experiment Station of Rutgers University during 1953 and 1954 seasons. Particular emphasis was placed on fruit quality during these tests. Fruit from the tested trees was checked for finish, russeting, and fruit cracking. Results indicate that no harmful effects need be expected from the combination of urea and pesticides in recommended spray programs. The Stayman variety, which is sensitive to russeting, was used in these tests.

During the first year of experimentation, various insecticides and fungicides were applied alone and in combination with urea at petal-fall and first and second cover sprays. During these tests both water-sprayed and water-plus-urea-sprayed checks were included for comparison.

During the second season of testing, urea was combined in recommended commercial pesticide spray schedules. During this program, soil applications of ammonium nitrate were used for all trees not sprayed with urea at a rate calculated to provide an equivalent amount of nitrogen.

The 1953 tests were conducted on 28 25-year-old trees at New Brunswick, N.J. Trees were sprayed until wetted, consuming an estimated 15 to 20 gallons per tree. Treatments included the use of wettable sulphur, captan, ferbam, lead arsenate, DDT, parathion, and urea (which was used at the rate of five pounds per 100 gallons of spray in all cases). The results of the 1953 test program showed no difference in russeting caused by including urea.

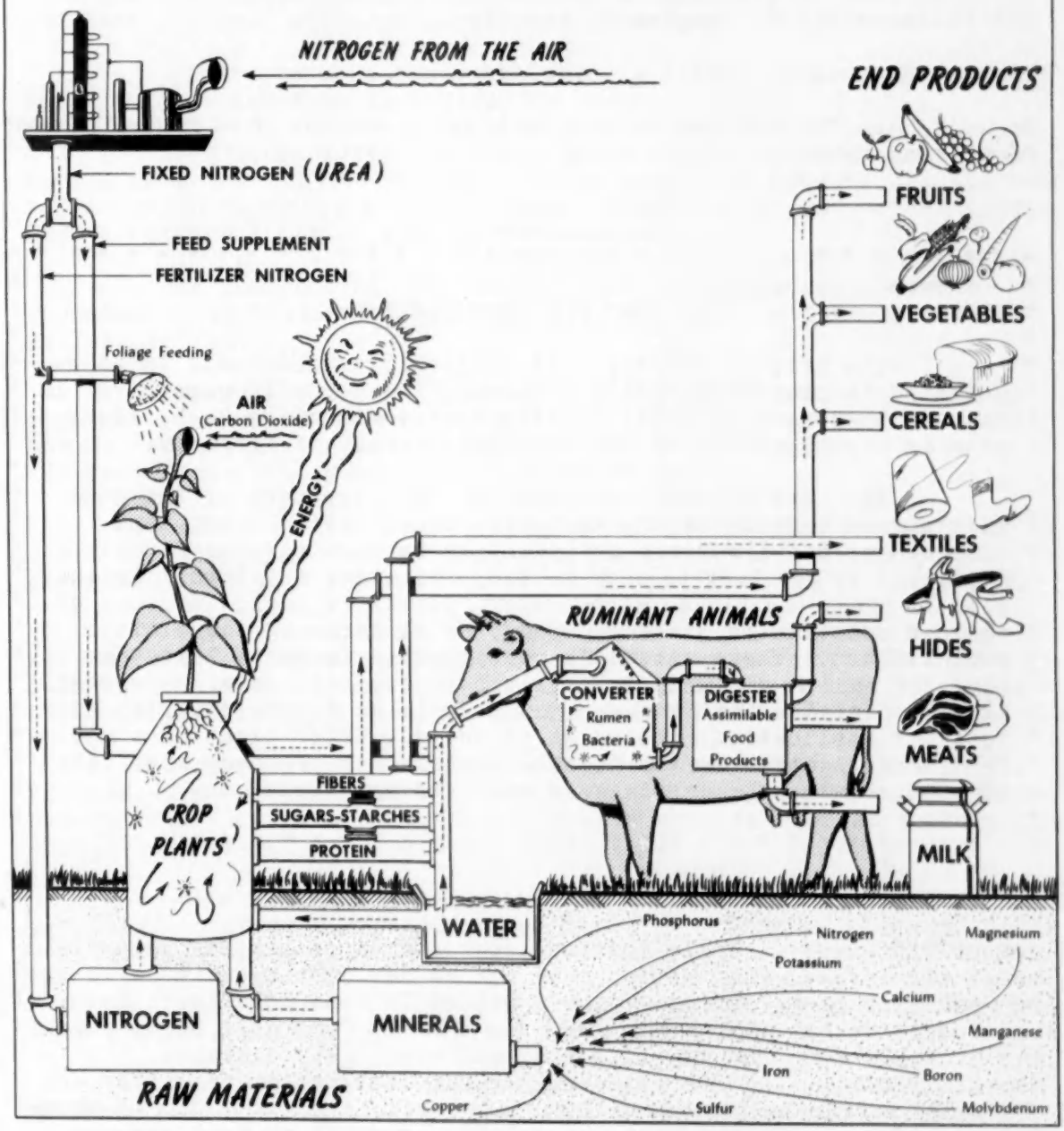
Slightly greater cracking of apples was observed in 1953 on trees sprayed with urea than on trees not sprayed with urea. This may be accounted for in part by the fact that urea-sprayed trees received one pound of additional nitrogen per tree. In the 1954 tests, in which equivalent amounts of nitrogen were supplied to all trees, no significant differences in amount of cracking were observed on trees receiving nitrogen from the two sources.

It is interesting to note here that fruit cracking was observed to vary significantly with the exposure on the tree to a much greater extent than it did as a result of different treatments. Fruit with an eastern exposure exhibited in general less cracking than on any other side of the trees. Fruit with a top-west exposure showed the most cracking.

Twenty-five-year-old trees at Cranberry, N. J., were used for the 1954 tests. Sprays were applied at the rate of 15 gallons per tree. Recommended schedules for pink, petal-fall, and first cover sprays were followed. In half the tests these were used without urea, nitrogen being supplied, as noted above, by ammonium nitrate ground

FARM FACTORY

CROP PLANTS AND LIVESTOCK PROCESS RAW MATERIALS INTO END PRODUCTS FOR EVERYDAY LIVING



"Chemurgic Digest", monthly publication dealing with inter-relations between industry and agriculture, carried the above picture of the "Farm Factory" in a recent issue. The drawing shows graphically how nitrogen in the form of urea is converted by plants and livestock into a variety of products to fill human needs.

applications at the rate of 0.87 pounds of nitrogen per tree. In the other half, urea was incorporated with the recommended pesticides. These included wettable sulphur, lead (with lime), ferbam, captan, TEPP, and one of the newer organic miticides.

Results of these 1954 tests showed no significant differences in fruit finish due to the incorporation of urea with any of the insecticides or fungicides tested.

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Editor's Note: The urea used in these tests was in the form of Du Pont's "NuGreen" fertilizer compound.

FOOD FOR GAME BIRDS

The help of two types of weed-killing chemicals is to be enlisted in providing better feed supplies for wild game birds in many of Wisconsin's public hunting areas, according to a recent item in a publication of the American Society of Agronomy.

The food patches, planted to corn, are part of the game maintenance program of the Wisconsin Conservation Department. Busy conservation workers who plant these corn patches find it difficult to get back to them to keep the weeds cut down. So they plan to treat the fields with either "Karmex" W herbicide, one of the new substituted urea compounds, or with one of the dinitro weed killers. These materials were applied in tests last year to plots of corn from which 50 bushels per acre were later harvested, it is reported. The chemicals are said to do the weeding job with just one application, put on at or shortly after planting time. Test work relative to the possible future use of these chemicals in commercial corn plantings is still being carried on.

FOR BETTER ROSES -- A new chemical combination to control both diseases and insects that attack rose bushes has just been added to the Du Pont line of garden chemicals. Called Du Pont Rose Insecticide and Fungicide, it will replace the familiar Du Pont Rose Dust, which was strictly a control of black spot and other rose diseases. In the new product, the effective fungicidal combination of sulfur and "Fermate" ferbam fungicide has been bolstered by the addition of three insecticides -- methoxychlor for residual control of most insects, lindane for quick insect knockdown and aphid control, and "Aramite" miticide for specific control of red spider mites.

THE CHALLENGE OF PROGRESS

Excerpts from an address by Ezra Taft Benson, Secretary of Agriculture, before the annual meeting of American Agricultural Editors Assn.

In recent months, I have talked with many farm scientists and farm leaders, with top farmers and ranchers. They assure me:

"There is more opportunity for a farmer to boost his income today than at any time in history!"

Some economists say the average farmer can increase his income by 25 per cent to 100 per cent or more...IF he uses all the new tools and new techniques...IF he uses the better breeds, better seeds, better feeds and better methods now available.

An increase of even 25 per cent in income could mean a thousand...two thousand...maybe as much as three or four thousand dollars extra.

We were talking. . .about how the government might add up to eight per cent to some farmers' income through price supports. Yet now we're saying a farmer through his own efforts might be able to add many times that much to the income he now has.

Isn't that a challenging fact? Doesn't that show we should place more emphasis on what the farmer can do, and less on what the government can do for him?

There are certain things government can and must do for agriculture. We must encourage agricultural research. Hybrid corn alone has raised the level of living more than all of the subsidies cornbelt farmers have received in the past 20 years.

When I say that there is a great opportunity ahead for farmers, I do not mean to infer we have not made tremendous progress. Almost within my memory, we've jumped from oxen-to-atoms...while agriculture in most of the world has stood still.

It's a fact that in no other nation today do so few farmers... produce so much food and fiber...to feed and clothe so many...at such a relatively cheap price.

This progress, achieved by the farmer's sweat, ingenuity and know-how, has paid off for all of our citizens.

For example: A Russian must work two hours to buy a pound of beefsteak. But one of our industrial workers earns his pound of beef with only 24 minutes of labor -- just one-fifth the time.

So it's a temptation to say our farmers are pretty good and let it go at that. There are plenty of frontiers today in the

basic challenge that as farmers we can be much better.

Proof of this opportunity lies in these dramatic figures: In Illinois last year, the top farmers on the better soils, but on the same size farm, earned $10,000 more than the average farmer. That's according to University of Illinois farm management records.

The net income of 1,000 Iowa farmers who kept records in cooperation with the Extension Service, was $8,353. But the top third of those earned a net income of $13,000 -- or 60 per cent more.

Each year the oil companies of America spend huge sums of money "wildcatting" for new sources of petroleum. These outlays dwarf our own expenditures designed to tap new reservoirs of agricultural wealth.

Isn't it about time to do some real "wildcatting" in agriculture? Here we are an industry which markets $30 billion worth of farm commodities each year. But we don't spend as much "wildcatting" for new ideas as a few major oil companies do on exploratory operations.

Yet I am convinced there are more potential "gushers" and pay zones in agriculture than in the richest oil field ever discovered. A "wildcatter" never knows whether he's 10 feet from a million dollars or a million feet from 10 dollars.

Back in 1924 American farmers harvested just under five million bushels of soybeans. This year our soybean production is estimated at a record-breaking 338 million bushels, with a market value of some $800 to $900 million.

Thus in the short space of three decades we have seen the development of a new major crop in this country and with it a new major industry. The versatile soybean has a wide variety of uses, from paints to plastics, from human food to livestock feed.

Think of what a profitable alternative crop would mean to wheat producers of the Great Plains States. Think of what a frozen concentrate or a stable, palatable whole dried milk would mean to our dairy industry. Think of what improved grasses would mean to our range country.

I think you'll agree with me that we stand on the threshold of agriculture's most thrilling decade. At the atomic research farm at Brookhaven, scientists are using atomic rays to produce new crops, new vegetables, new fruits.

It's an age of chemistry...25 cents worth of hormones may put $25 worth of beef on a steer. Some chemicals will delay ripening of crops...others will speed their maturity. Systemic insecticides allow plants and animals to bite back at the bugs.

Farming isn't just men and land and animals and machines. It's one of the most exciting laboratories in the world today. It holds promise of vastly greater material benefits to man than he has ever known since the beginning of time.

INDIVIDUAL RESPONSIBILITY

Excerpt from a recent speech delivered before the
National Safety Congress in Chicago, Illinois by
Crawford H. Greenewalt
President
E. I. du Pont de Nemours & Co., Inc.

In the early days of industrial enterprise, we can assume, I think, that the role of the individual was quite clear and quite obvious. A hundred years ago, something like four out of every five persons were self-employed, the exact opposite of today's situation in which four out of five are employees of someone else. In the 1850's, even the one in five who was an employee was very probably one of a small group working under the direct eye of the proprietor. Business units were small and compact and communication was simple. Every man was, in effect, in business for himself, and his own responsibility either as manager, owner, or artisan, was clear, well defined, and easily understood.

As time went on, tools and techniques became too complex and expensive for the individual either to own or to use by himself. He devised organizations which permitted him to share the cost, the risk, and the effort with others. The demands of the times brought forth the integrated team into which were consolidated the specialized services of many different kinds of workers and technicians. Much of our present industrial effort demands the organization of large numbers of people -- for modern production methods require unusual combinations of skills and resources -- for the manufacture of steel, for example, or for the making of automobiles and aircraft. Even research, with the advance of science, has of necessity come out of the attic and the backyard workshop into the laboratory with hundreds of employees.

This merging of individual into group effort was perhaps inevitable -- and, in a sense, is a measure of our progress, for the team exerts a leverage upon human effort that enables us to do together things far beyond the range of any of us working alone. It is a trademark of our times and, I am sure, a hallmark of our future. It is probable that we will become even more dependent on large organizations as our science and technology advance.

Unfortunately, as we become more and more dependent upon team performance, it becomes increasingly difficult to isolate and recognize individual accomplishment. Because we are faced with complexities and challenges which often are too sweeping for personal solution, the importance and significance of the individual is very likely to be minimized. In the field of science, in the field of business, in the field of politics, and in the military, we see emphasis placed on the theory that the individual exists only as member of a group and that he is valuable and effective only as he works well with others.

This situation has created what seems to me to be a major

management problem. For we must always, no matter how conditions change, preserve the individual incentive and individual opportunity that is vital to all successful endeavor. To the extent we sacrifice that opportunity and incentive, we sacrifice, as a simple matter of cause and effect, the dynamic thrust of our industrial economy.

Whether he is a member of a group or a solitary independent, it is the individual to whom we must look for accomplishment, for no group effort can ever be anything more than the summation of combined individual efforts. The raw stuff of all progress is people. No matter how well organized or how technically sophisticated we become, the fact is that progress originates in creative thought, a purely personal attribute -- just as characteristic of the worker on the machine as it is of the scientist in the laboratory, or the writer in his study.

The great advances in science and in thought have come about through the efforts of people -- people who perhaps struggled against the restrictions of environment, and who had the vigor, imagination, and initiative to question traditional patterns of thought. We have progress only when some individual, distrustful and impatient with existing concepts, blazes a new trail into the unknown, or has a dream and the individual initiative to make it come alive so that others may see.

We must not obscure the essential uniqueness of the individual by permitting the composite of the many to become a standard. There is evidence that we are in danger of doing so. Too many of our research establishments have a tendency to measure their stature in terms of staffs, buildings, equipment, and budgets. Too much of our legislation appears to discriminate against and to discourage individual accomplishment. Too many of our schools seem to be teaching us that man's highest pedestal can be reached through harmonious conformity rather than original personal achievement.

It seems to me that there is much danger in the assumption that quantity will ever beget quality. It is fallacious reasoning to expect that, if five men in a laboratory can produce a given result, ten men will produce twice as much, or that any amount of money and staff and buildings can substitute for the creative output of a single gifted individual. I suppose the earliest team efforts on record were the military exploits of armies in the field. Time and again, history has shown that mere weight of numbers does not win battles. Time and again, we have seen the inspiration and example of determined and dedicated men upset mass action. Time and again, we have seen an individual with an idea redirect the energies and objectives of a multitude.

Our problem is to keep alive the powerful stimulant of individual thought at all levels and in every phase of our effort. We cannot afford to make a displaced person out of the Man with the Big Idea.

Individuals cannot be classified into neat little bundles and judged wholly on their capacity for adjustment. The other day I

took one of the standard psychological testing sheets used so widely now in personnel work and applied it to a rare and highly individualistic American -- Benjamin Franklin. Based on what we know of Franklin's character, I could only conclude that he would have had bad luck winning a place for himself today if he were judged on these standards.

Some of the questions are rather interesting. One, for example, asks, "Do you day-dream?" Ben, I am afraid, did. An affirmative answer would merit a poor score on the test, although Franklin's day dreams brought useful results in fields ranging from political science to stoves and bifocal spectacles.

"Are you impatient?", another question reads. Ben was -- at least, he was impatient with conditions he found unsatisfactory and equally so with the people he thought responsible. "Are you more entertained by books than by companions?" I would guess that he was, at least by some books than by some companions. The response would be held against him presumably on the theory that it is better to be gregarious than to be well-read. On some questions, I must concede I was unable to find any answer. Did he, for example, "get hungry suddenly with a quick pang?" I don't know, nor am I sure what that question is supposed to tell us.

My guess is, too, that Charles Goodyear and Elias Howe would have been rated as impractical dreamers, and Thomas Edison, with a history of insomnia and carelessness in dress, might well have been regarded by the modern personnel manager as an undesirable risk.

I commend this little exercise to you as an amusing way of passing an afternoon in testing yourself and your contemporaries, but don't be too distressed if you fail to make the grade.

It is quite obvious that these men of unusual gifts would fail to measure up by accepted group standards for the very reason that they were unusual men and it was their unusual characteristics that led them to greatness. In their refusal to accept without question the conventional restriction or the status quo of their times, they pioneered along trails where none had ventured before, and created much of value to the world.

Here then is a major problem -- our economy requires group effort to perform its increasingly complex tasks, it requires also individual genius and accomplishment if we are to go on to greater spiritual understanding and material well-being.

The horizons before us are indeed unlimited. Where the new pattern of science will lead, I do not pretend to know, but I am certain that the future will make the present as obsolete as the present has made the past. I will make one prediction -- the scientific miracles of the future, like those of the past, will be wrought by men and women with courage, with the pioneering instinct to plunge ahead and to take the bold chance.

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Editor's Note: Complete text of Mr. Greenewalt's speech may be obtained on request.

Yellowing in Alfalfa Is Caused by Attacks of

POTATO LEAFHOPPER

By Dr. C. R. Weaver
Ohio Agricultural Experiment Station

A green insect about an eighth of an inch long was the most destructive insect species in Ohio in 1953, according to estimates of nine state entomologists. Known as the potato leafhopper, a common pest of potatoes, the bug assumed this importance largely because of its attacks on second cutting alfalfa hay. While an individual leafhopper is small in size, large numbers of the species can severely damage alfalfa by sucking the sap and by destroying important water and food transporting tissues.

During an attack of the leafhopper, alfalfa plants become stunted and the leaves turn yellow. Yellowing in alfalfa may be caused by a number of factors including nutrient deficiencies, diseases, and insects. The most important of these is the potato leafhopper. Damage by this insect is recognizable in its early stages by the characteristic wedge shape of the yellow area. Yellowing due to other causes may begin at the margins or other parts of the leaves, but it is not wedge shaped.

DDT Helped Control

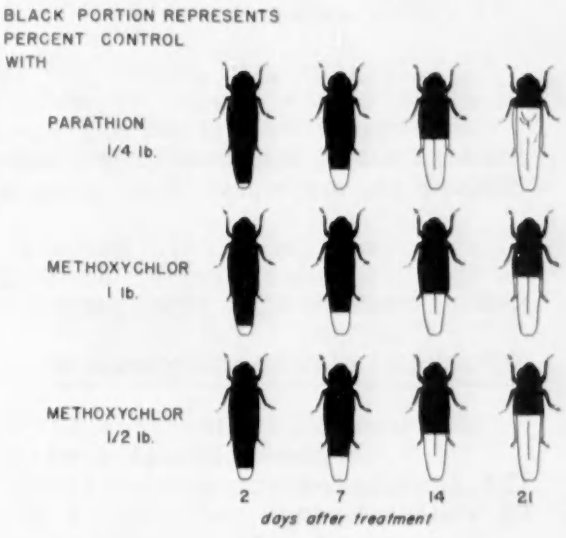
This species has been recognized as an important potato pest for a great many years. No one realized, however, the tremendous toll that these tiny green bugs levied on the potato plant until the advent of DDT. When potato growers began using DDT to control the leafhopper, yields almost doubled. Today alfalfa growers are not generally aware of the damage wrought by the leafhopper on alfalfa. In fact, many farmers fail to see the insect because of its minute size.

Last year, 1953, was an extremely bad leafhopper year in Ohio. In alfalfa variety trial plots at the Ohio Agricultural Experiment Station in 1953, nine different varieties of alfalfa were treated to control the leafhopper. Portions of each variety plot were left untreated. In every instance the yield was increased by the treatment; the average increase amounted to 53 per cent.

Unlike the potato farmer, the alfalfa grower cannot use DDT to control the potato leafhopper. DDT residue is objectionable when the crop is fed to dairy animals. Until some insecticide without a harmful residue was developed, no acceptable control was known for the damage that leafhoppers caused on alfalfa.

Fortunately two such insecticides have been available for use during the past three years. These are methoxychlor and parathion. Methoxychlor, in amounts recommended, is practically harmless to warm-blooded animals. Its residue is considered unimportant. Parathion is an extremely powerful insecticide that is dangerous to human beings,

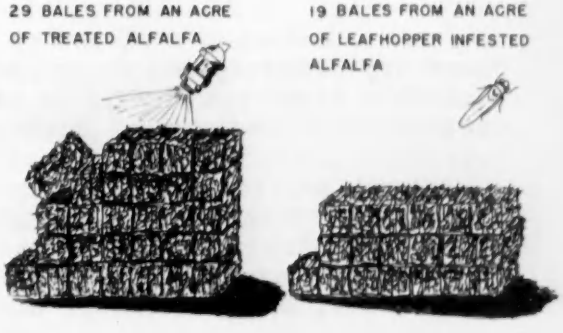
but after it has been sprayed on plants, its residue does not persist for more than a few days. The residue has a short enough duration that the insecticide may be used on a hay crop if applied not later than two weeks before harvest.



Methoxychlor appears to be the best method for keeping the potato leafhopper under control. The little difference between the pound and half-pound treatment raises the question of whether the additional expense is worthwhile for the extra effect.

During the three seasons 1951-1953, methoxychlor and parathion were tested for leafhopper control. Methoxychlor was used at one-half pound and one pound per acre. Parathion was used at one-fourth pound per acre. Both materials were used in liquid form suitable for use in weed sprayers now common on the general farm.

Comparisons of the effectiveness of these three treatments were made in ten different experiments during the three years. Parathion gave somewhat higher initial control than methoxychlor. The residual action of methoxychlor gave it some advantage over parathion two and three weeks after treatment. Methoxychlor at one pound was slightly better than at one-half pound. The difference was probably not enough to justify the extra cost. Each of the three treatments was always sufficiently effective to prevent yellowing of the alfalfa.



Treating alfalfa for the potato leafhopper pays off. On the average the treated acreage will produce about 10 more bales per acre as indicated by this drawing.

Control of the potato leafhopper is a preventive treatment, not a cure. The insecticide must be put on before the alfalfa turns yellow. Once the leaves have discolored nothing will make them green again. For this preventive treatment, apply one-half to one pound of actual methoxychlor per acre to alfalfa one to two weeks after the first cutting, depending on the recovery. The plants should be from four to six inches high.

Parathion may be used at the rate of one-fourth pound actual toxicant per acre. It should be used by only experienced spray operators who are willing to follow the safety precautions prescribed by the manufacturer.

Both insecticides are available in liquid, wettable powder and dust form. The liquid formulations are recommended for use in low

volume sprayers. The wettable powder forms are suitable only in high volume, high pressure type sprayers with mechanical agitators in the spray tank.

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Editor's Note: The above article and graphs first appeared in OHIO FARM AND HOME RESEARCH and are reprinted here through the courtesy of that publication.

NEW TREATMENT WITH CHEMICALS

IMPROVES LEATHER PERFORMANCE

A new chemical treatment for leather, which may increase the demand for top-grade hides, has recently been announced by the Du Pont Company.

First use for this treatment is being seen in the field of suede leather garments. In a process employing Du Pont's "G-942" tanning agent and "Quilon" chrome complex, suede is made water resistant and at the same time conditioned so it can be dry cleaned by usual methods.

Research work is continuing in the matter of treating gloves, where dry cleaning and washability are important. It is also expected that this development will be valuable in the case of side leather and certain sole leathers of shoes, to improve water resistance.

Unlike the oils usually used to lubricate leather, "Quilon" anchors itself in the leather fibers and does not leach out or spread in dry cleaning. As a result, the treatment allows suede garments to be cleaned by ordinary commercial methods, without loss of texture, flexibility, or pliability, and without change in color.

A striking aspect of the treatment is the water resistance given suede leather. A suede sports jacket treated with "Quilon" may be wet by a sudden shower without rain penetrating the garment. While the surface may become moist, it dries in a matter of minutes. This water resistance is achieved without blocking the ability of the leather to breathe -- an important feature in garment comfort.

Use of "G-942" in the process imparts plumpness and silkiness of nap to the suede leather surface, enhancing the beauty of the finish.

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ARMYWORMS -- To control fall armyworms, methoxychlor may be used on forage grazed by dairy cows at the rate of one to one and a half pounds an acre as a spray, according to a recommendation from Texas A. and M. College.

DESCRIBES IMMENSITY OF

SAVANNAH RIVER PROJECT

Energy from the atom to light our homes, run our milking machines, and do countless other tasks seems no longer a remote, fantastic possibility. Human technology and the desire to improve our resources for productive effort are being bent toward the peacetime uses of this awesome source of power.

How the combined efforts of big and little business, of labor and management, were fused together to harness the energy of the atom at the Savannah River atomic energy plant, was told for the first time recently by Granville M. Read who, as chief engineer of the Du Pont Company, has been in charge of design and construction.

"As a scientific and engineering achievement, harnessing energy like that generated in the stars is without precedent," he declared. "It demonstrates what can be accomplished when science, business, and labor willingly join hands at government request for the defense of America and the free world. It reflects the complementary responsibilities of big and small businesses in serving our free economy -- and the people of our country."

Explaining why Du Pont and other large companies were involved early in plans for the Savannah River operation, Mr. Read pointed out:

"When our government mobilizes men and materials for defense efforts, it turns first to the big basic industries -- steel, metals, motors, electrical, power, chemicals, machine tool, transportation, and many others. It uses them as the foundation on which to build the entire defense structure, for only they have the capacity in technology, men, management, and machines to undertake big and difficult tasks quickly. . .Integrated into this mobilization program are literally thousands of little businesses whose contributions are equally as essential."

He noted that 8,100 other companies participated in the construction and that 5,745 of them were small firms employing less than 500 people. Altogether, Du Pont placed more than 138,000 purchase orders totaling over $500,000,000. More than 87,000 of the orders, totaling about $245,000,000, went to the small companies.

"The nuclear physicists," Mr. Read said, "transferred their thinking to the heavens above, and were calculating how to duplicate the reactions of the stars, so as to create on earth -- and make available to mankind under controlled conditions -- the same sort of energy as that generated in vast amounts in these celestial bodies. This is literally what is now being contemplated in atomic fusion."

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Editor's Note: Full text of Mr. Read's talk may be had on request.

EXPERIMENTERS' NOTATIONS

A Round-up of Data from Across the Nation

What's the economic pay-off attributable to a brush control program on a practical ranching operation? The county agent's office in Jim Hogg County, Texas, has supplied one answer from their files. Five years ago a brush control program was started on the Benavides Brothers ranch. By last summer, 6,000 acres of brush country had been put in use. The calf crop had increased from 70-75 per cent, to 85-90 per cent. Calves were reaching salable age at a weight of 180 pounds more per head, and market quality of calves had improved by a full grade. Carrying capacity had been increased from about 40 acres per animal unit to 20 acres per head.

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On one specific brush problem in the Southwest, a copy of the "New Mexico Extension News" reports that "Ammate" weed and brush killer at a pound per gallon of water gives a quicker kill of juniper than any other chemical.

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In tests at the New Jersey Agricultural Experiment Station, methoxychlor has produced some remarkable results in protecting blueberries from heavy infestations of cranberry fruit worm. Where untreated berries were worthless at both first and second pickings, sprays containing methoxychlor gave almost complete protection. The applications were at the rate of three pounds of "Marlate" 50 (a 50 per cent active methoxychlor wettable powder) per 100 gallons of water.

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Botrytis leaf and flower blight have been particularly serious disease threats to the commercial production of gladiolus in Oregon. A recent circular from Oregon State College advises the use of "Fermate" fungicide at two pounds per 100 gallons of water when air movement is restricted or conditions otherwise favor development of the disease. On fields being grown for cut flowers, where a dark residue on blossoms cannot be tolerated, a nabam type fungicide, such as liquid "Parzate" at the rate of two quarts per 100 gallons of water, is recommended. In addition to spraying, all old flower spikes should be destroyed.

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At the Waltham Field Station in Massachusetts, work has been in progress to control cabbage club root. Good results are reported by mixing about a half-teaspoonful of "Manzate" fungicide with the soil at the point where the cabbage was to be transplanted.

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